Missouri Department of Natural Resources

Total Maximum Daily Load Information Sheet

Stinson Creek

Waterbody Segment at a Glance:

County:	Callaway
Nearby Cities:	Fulton
Length of impairment:	0.1 miles
Pollutants:	Biochemical Oxygen Demand (BOD) and Volatile Suspended Solids (VSS)
Source:	Fulton Wastewater Treatment Plant (WWTP)

State map showing location of watershed

TMDL Priority Ranking: High

Description of the Problem

Beneficial uses of Stinson Creek

- Livestock and Wildlife Watering
- Protection of Warm Water Aquatic Life
- Protection of Human Health associated with Fish Consumption

Use that is impaired

- Protection of Warm Water Aquatic Life

Standards that apply

- The Missouri Water Quality Standard, found in 10 CSR 20-7.031 Table A, for dissolved oxygen (related to BOD) in streams is 5.0 mg/L (milligrams per liter or parts per million).
- Standards for Volatile Suspended Solids may be found in the general criteria section of the WQS, 10 CSR 20-7.031(3) where it states:
  - Waters shall be free from substances in sufficient amounts to cause the formation of putrescent, unsightly or harmful bottom deposits or prevent full maintenance of beneficial uses.
  - Waters shall be free from substances in sufficient amounts to cause unsightly color or turbidity, offensive odor or prevent full maintenance of beneficial uses.

Background information and Water Quality Data

Any waterbody that was listed for Non-filterable Residue (NFR) in 1998, such as Stinson Creek, is now being listed for Volatile Suspended Solids (VSS). This change was made to better distinguish between organic solids coming from wastewater treatment plants (VSS) and mineral solids (soil or

mineral particles) coming from soil erosion or erosion of mine waste materials or stockpiles (Non-Volatile Suspended Solids or NVSS).

Some of the water quality studies conducted on Stinson Creek from 1988 – 1999 showed deposits of solids and lower levels of dissolved oxygen below the discharge from the Fulton Wastewater Treatment Plant (WWTP). Wastewater that is high in BOD (Biochemical Oxygen Demand) lowers the dissolved oxygen in a stream. Many aquatic organisms require high levels of oxygen to survive. VSS refer to particles that are suspended in water, like algae, or those that settle out, like the sewage sludge in Stinson Creek. When these solids settle to the bottom of a stream, they smother the streambed and fill in important habitat for aquatic invertebrates and fish.

Data has been collected at the Fulton WWTP by the department and U.S. Environmental Protection Agency since the early 1990s. During this period, early morning Dissolved Oxygen (DO) levels during low flow conditions were measured upstream and downstream of the Fulton discharge. On five of the seven occasions, downstream DO was higher. This leads the department to conclude that the typical downstream DO conditions either maintain or improve the "normal DO profile" upstream of the outfall and is thus in conformance with state WQS. Also, while occasional pockets of sludge (VSS) have been observed during routine Stream Surveys, Stinson Creek is consistently rated as achieving "Full Attainment [of its beneficial uses] but Stream Shows Some Impact" from the pollutants.

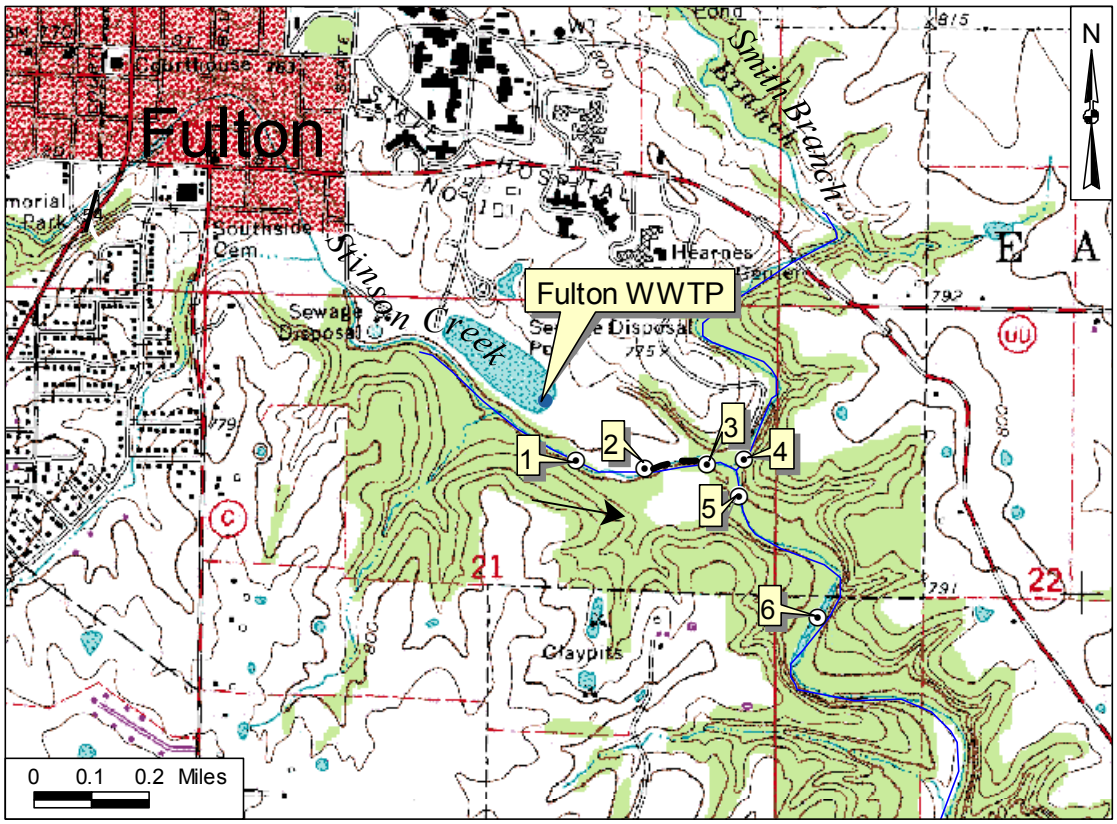
Like all wastewater discharges in Missouri, the Fulton WWTP is required to meet specific limits contained in a discharge permit issued by the department. The permit is currently (7/2004) being renewed. By making changes to the conditions of the discharge permit, the quality of the plant discharge will be improved and result in improvements in Stinson Creek.

Water quality data collected in the summer of 2001 and 2002 is shown in the table below, with the map of sample locations on the next page.

Site #	Site Name	Year	Month	Day	Time	Flow	Temp	DO	pH	NH3N
1	Stinson Cr. 0.1 mi.ab. Fulton WWTP	2002	8	8	732	0.02	18	4	7.5	0.02499
1	Stinson Cr. 0.1 mi.ab. Fulton WWTP	2002	8	8	1353		26	4	8.2	0.02499
2	Fulton WWTP Outfall #001	2001	8	16	700	2.3	24	7.8	7.9	0.06
2	Fulton WWTP Outfall #001	2001	8	17	1410	2.4	23	6.8	8.1	0.02499
2	Fulton WWTP Outfall #001	2002	8	8	730	1.5	24	6.1	7.8	0.02499
2	Fulton WWTP Outfall #001	2002	8	8	1346		25	7.1	8	0.02499
3	Stinson Cr. 0.1 mi.bl. Fulton WWTP	2002	8	8	722	1.5	22	4.3	7.9	0.02499
3	Stinson Cr. 0.1 mi.bl. Fulton WWTP	2002	8	8	1332		26	7.2	8.2	0.02499
4	Smith Branch near mouth	2001	8	16	1430	0.5	23	6.5	8	0.02499
4	Smith Branch near mouth	2001	8	17	640	0.5	19	5.3	8.1	0.02499
5	Stinson Cr. 0.2 mi.bl. Fulton WWTP	2001	8	17	705	0.3	20	4.8	7.8	0.05
5	Stinson Cr. 0.2 mi.bl. Fulton WWTP	2001	8	16	1405	0.3	24	10.3	8	0.02499
6	Stinson Cr. 0.5 mi.bl. Fulton WWTP	2002	8	8	657	1.5	20	3.9	7.9	0.02499
6	Stinson Cr. 0.5 mi.bl. Fulton WWTP	2002	8	8	1310		25	12.9	8.4	0.02499

Note: Flow in cubic feet per second, Temperature in degrees Celsius, DO and NH3N (ammonia as nitrogen) in mg/L

Stinson Creek in Callaway County, Missouri, with Sampling Sites



Impaired Segment → Direction of Flow

Sample Site Index

1 – Stinson Creek above Fulton WWTP discharge
2 – Fulton WWTP Outfall (discharge)
3 – Stinson Creek 0.1 mile below WWTP
4 – Smith Branch near mouth
5 – Stinson Creek 0.2 mile below WWTP
6 – Stinson Creek 0.5 mile below WWTP

For more information call or write:

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